



INL research librarians Bernice Kunkel (left) and Gail Willmore were part of a team that helped catalog, resurrect and digitize a historic collection of nuclear reactor wall chart drawings.

INL Research Library key in bringing nuclear reactor diagrams back to life

By [Caitlin Lanier](#), for *INL Communications & Governmental Affairs*

Hoarders take heart. Librarians at Idaho National Laboratory's [research library](#) have kept an illustrated chapter of nuclear history so well catalogued and preserved that they were able to digitize the artifacts and make them more broadly available to the public.

Gail Willmore, a librarian at Idaho National Laboratory's research library, helped provide historic nuclear reactor wall charts to Ron Knief of [Sandia National Lab](#). In total, the INL Research Library provided nearly 60 percent of the drawings for a digitization project by the [University of New Mexico](#) and the U.K. trade publication Nuclear Engineering International.

"Since the beginning of the INL Research Library, the major subject focus has been nuclear power," said Dave Klepich, the project manager for the INL Research Library. "As time passed, but long before the term 'nuclear renaissance' entered our vocabulary, library staff recognized the unique historical nature of INL research and consciously pursued a course to retain and preserve those scientific and technical publications, which documented the progress of nuclear science."

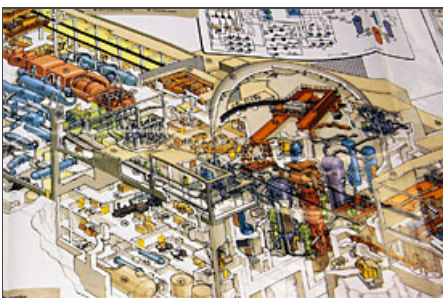
Their diligence most recently paid off when the library received a request for large reactor drawings few had thought to save.

From April 1956 until October 2003, NEI published large fold-out drawings of nuclear reactors from locations around the world in select monthly publications. These drawings spanned nearly every type of reactor technology, including pressurized water reactors, boiling water reactors, pressurized heavy water reactors, fast breeder reactors, high-temperature gas reactors and more.

Knief, a former UNM professor and Sandia National Lab researcher, understood and appreciated the educational importance of the nuclear reactor drawings provided in NEI's monthly publication. He had acquired and saved some of the drawings and frequently used them in his nuclear energy classes.

"I could teach you more about a reactor in 10 minutes with one of these than I could by talking to you for several hours using more traditional one-line diagrams and photographs," Knief told Stephanie Hobby of Sandia Lab News.

While editing a new edition of his nuclear engineering textbook, Knief realized that having access to these drawings would be a priceless addition to the book.



The World's Reactors No. 101, South Korean Standard Nuclear Plant (pressurized water reactor) from NEI's August 1992 issue.

"At the back of my book, I put a lot of effort in developing an appendix that I had identified reference reactor characteristics...so that it is easy to put them side by side for a student or professor to make comparisons," Knief explained in "Meet the hoarder," an article on the NEI website. "And I thought, 'How about getting the [wall] charts for the reference reactors?'"

Unfortunately, after contacting the NEI publishers, he learned they did not have copies of these drawings.

Determined and left to his own devices, Knief began contacting colleagues and librarians at various national labs around the U.S. Through a network of connections, he contacted J. Todd Taylor and Mary French of INL's Criticality Safety Engineering Department. He sent an e-mail asking them to contact INL's research library to see if it had any copies of the drawings.

"Unfortunately, Sandia, Argonne, Brookhaven, [Department of Energy headquarters], UNM, and others have absolutely nothing," he wrote. "Even if [the librarians] don't have anything, someone



The High Temperature Reactor 500 was designed for a group of German and Swiss utilities in the late 1980s.

might be able to identify individual INL 'pack rats' who still do."

French contacted Willmore at the INL Research Library to request assistance in finding the charts.

Thanks to the INL Research Library's superb preservation activities, Willmore located the very publications Knief was looking for in the library's comprehensive nuclear-related collection.

"After I identified, retrieved and made an index of what we had, I sent the index to Ron Knief," Willmore said. "He then identified which ones he was missing."

Willmore then wrote to NEI's Wil Dalrymple to request the publisher's permission to scan and copy the wall charts. When Dalrymple responded, he praised the virtue of librarianship and saving valuable materials by saying, "What would we do without librarians! This is amazing."

Klepich, the library's project manager, similarly commends the librarians' tenet in archiving information.

"The library's ability to fill Dr. Knief's request, when even the original publisher was unable to respond, points to the farsightedness of our early librarians, and underlines the reality of possible loss of irreplaceable information," he said.

With permission from NEI for reproduction, the charts were then sent to French for scanning. INL funded the digitization process for the scanning of their drawings, which represented the majority of the recovered wall charts.

"INL was the mother lode and, in short, they provided almost 60 percent of the 100-plus charts that I've now accounted for," Knief said in the Sandia Lab News article, "Reactor: Art worth saving."

Plus, the digitized drawings are benefiting more than just history buffs. Bill Phoenix, an applied engineer in INL's Human Factors, Instrumentation and Control Department, said the value and importance of the drawings was immediately clear.

"Wow, this is like Christmas," he said. "The files weren't in my computer more than a minute before we were using them in our Human Factors Simulations Lab to orient test subjects. Talk about immediately relevant and useful! They enlarge to an 8-foot by 6-foot screen quite nicely."

The University of New Mexico, with NEI permission, has uploaded to its Web page moderate-resolution files of the drawings, which are available to the public free of charge. Yet, NEI still owns the rights to the drawings and offers high-resolution pdf files for about \$100 each or laminated prints for \$200.

Additional Links:

See the wall charts at at [NEI's website](#) or at the [UNM library's website](#).

Read NEI's article "[Meet the hoarder](#)."

Read coverage of this effort from [Wired.com](#).



INL research librarians (from left) Bernice Kunkel, Barney Hadden, Gail Willmore, Ben Hoganson, Theresa Oh and Rita M. Wells.

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